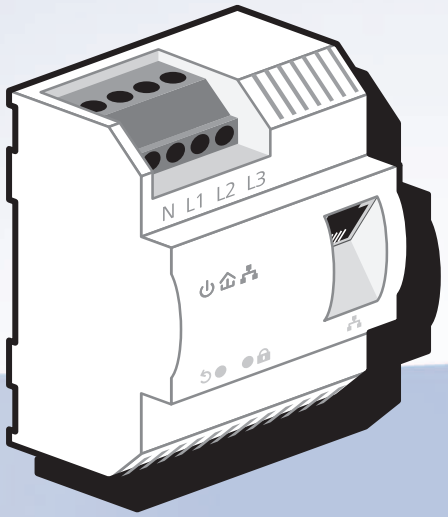
dLAN® 200 AVpro DINrail



devolo dLAN® 200 AVpro DINrail

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Aachen, May 2011

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1 Preface

1.1 Thank you for placing your trust in this devolo product.

devolo dLAN solutions are a favourably priced option for using the power grid infrastructure in a building to establish a broadband IP network. The advantage this brings is obvious: no new cables have to be laid – expenditure and costs remain low. The dLAN 200 AVpro DINrail, based on the HomePlug AV standard, transmits data, voice and video over the power line at rates up to 200 Mbps. Whether used in a simple home network or as a link between the power industry and telecommunications for transmission of consumption data—the dLAN 200 AVpro DINrail is versatile. It can be connected to the mains supply in either a single-phase or three-phase connection.

1.1.1 About this manual

Having begun with the introduction to the "dLAN" topic and the functional description of the dLAN 200 AVpro DINrail with corresponding networking examples in Chapter 2, in Chapter 3 you will learn how to set up the dLAN 200 AVpro DINrail successfully while taking into account the safety instructions. For information on configuring the dLAN network, please see Chapter 4. Chapter 5 contains statements about the product's environmental compatibility as well as our warranty terms.

You can find the technical data on the dLAN 200 AVpro DINrail in the product information sheet on the enclosed product CD.

Description of the symbols

Here we briefly describe the meaning of the symbols used in this manual.

Very important note. Failure to observe this note may result in damage.

Important note that should be observed.

Additional information, background material and configuration tips for your device.

If you have any further ideas or suggestions related to our products, please don't hesitate to contact us at support@devolo.com!

devolo on the Internet

For detailed information on our products, visit www.devolo.com.

The area dLAN for business projects not only contains product descriptions and documentation, but also updates of devolo software and your device's firmware.

We especially recommend the descriptions of the "dLAN network," which are arranged according to Application, Sectors and Integration, where you can find lots of interesting background information.

1.2 CE conformity

The product conforms to the basic requirements of EMC Directive 2004/108/EC and the other relevant provisions of the Radio and Telecommunications Terminal Equipment Act (FTEG) and is designed for use in the EU and Switzerland. The product is a Class B device.

The CE declaration for this product is on the included product CD *under* CE.

1.3 Intended use

Ensure that the dLAN 200 AVpro DINrail is used according to its intended use in order to prevent damage to it or other devices:
The intended use of the dLAN 200 AVpro DINrail is connecting devices in the installation area (e.g. intelligent power meter (MUC), Internet access device) to the household dLAN network for data transmission (e.g. consumption data, Internet data).
The dLAN 200 AVpro DINrail is intended for installation on the top-hat rail in the installation area of overvoltage category 3 or lower.

2 Introduction

dLAN is an intelligent, secure technology that lets you set up a home network easily, quickly and economically via your household electrical wiring, without the need for complex and expensive dedicated cabling. The available performance and effort required for the installation also compares favourably to traditional methods.

2.1 What exactly is dLAN?

dLAN (direct Local Area Network) uses the household power grid to transfer data between computers equipped with suitable adapters and other network components. As a result, any power outlet can be used as a network access point. The data is modulated prior to transfer and sent as a signal via household power lines. State-of-the-art technology ensures that the power and data networks do not interfere with one another. Networking via dLAN is fast and secure. The data is encrypted using a key to prevent easy interception by third parties.

2.2 dLAN 200 AVpro DINrail

The dLAN 200 AVpro DINrail combines the power industry and telecommunications and brings you one step closer to transparent cost statements for your consumption data. The energy data is transmitted from the intelligent power meter to your computer via the household electrical wiring. With a transmission speed of up to 200 Mbps, the dLAN 200 AVpro DINrail is also ideally suited for high-speed Internet.

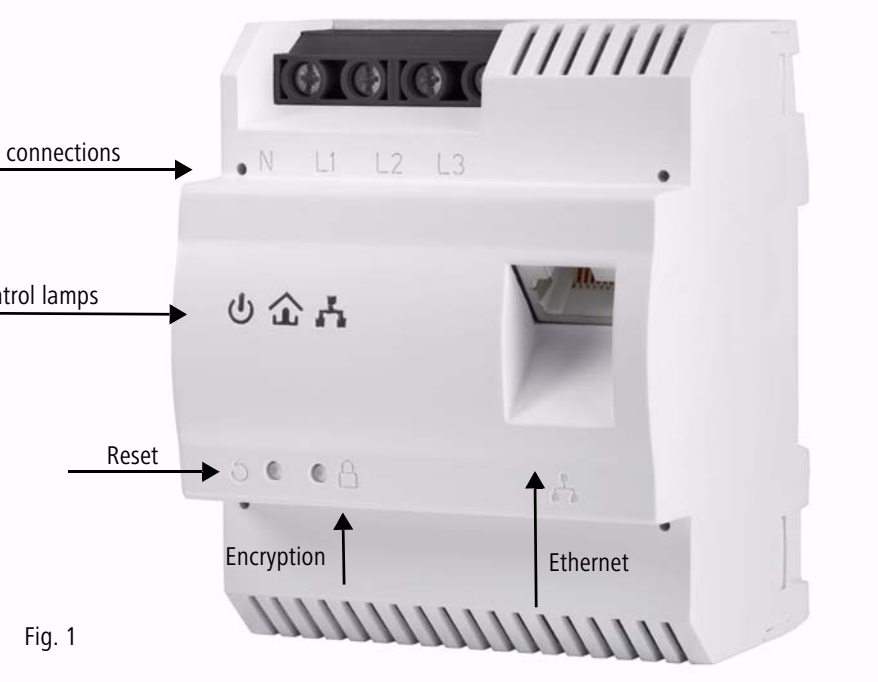

Fig. 1

2.2.1 Functions

- Direct installation in the control cabinet or power distribution box
- Optional: three-phase network connection for optimal network coverage
- Remote management via the dLAN 200 AVpro manager management software
- Integrated Quality-of-Service functions (QoS) for automatic data prioritisation
- Quality indicator LED for determining broadband status
- Ethernet port with Auto MDI/X
- Master/slave or peer-to-peer architecture
- Segments possible with up to 63 slaves per master
- Data transmission with a range up to 300 metres in the power grid
- Powerful 128-bit AES security for securing data transmission against unauthorised access
- Further extensive configuration options (notching, output power etc.)

2.2.2 Ports

Line connections (Fig. 1)

This is where you connect the conductors to the corresponding line connections.

NOTE:

Single-phase connection: Neutral conductors and external conductors are connected to terminals N and L1.

Three-phase connection: Neutral conductors and external conductors are connected to terminals N and L1. The connection of external conductors L2 and L3 is optional and intended for optimising the signal transmission. The device is supplied with power via terminals N and L1.

The permitted conductor cross-section for connection to the terminals is 0.18 mm² to 6 mm².

Ethernet connection (Fig. 1)

This is where you connect the dLAN 200 AVpro DINrail via an Ethernet cable to the intelligent power meter (MUC) or another Ethernet device (e.g. Internet access device).

2.2.3 Control lamps

Power (Fig.1)

Illuminates green when the dLAN 200 AVpro DINrail is ready to operate; flashes green when the dLAN 200 AVpro DINrail is in standby mode.

dLAN (Fig. 1)

Illuminates green if the bandwidth is optimal, i.e. the network connection is suitable e.g. for HD video streaming; flashes when data is being transmitted.

Illuminates orange if the bandwidth is good, i.e. the network connection is suitable e.g. for SD video streaming; flashes when data is being transmitted.

Illuminates red if the bandwidth is adequate, i.e. the network connection is still suitable for transmission of energy data or Internet access; flashes when data is being transmitted.

Ethernet (Fig. 1)

Illuminates green if there is a connection to the Ethernet network; flashes when data is being transmitted.

2.2.4 Buttons

Encryption button (Fig. 1)

Data encryption at the touch of a button; for a functional description of the encryption button, please continue reading in chapter 4.2 dLAN AV network encryption at the touch of a button.

Reset button (Fig. 1)

The device is restarted by pressing the reset button.

2.3 Sample applications

Use dLAN 200 AVpro DINrail to set up a network easily, quickly and economically via the mains supply network (Fig. 2)

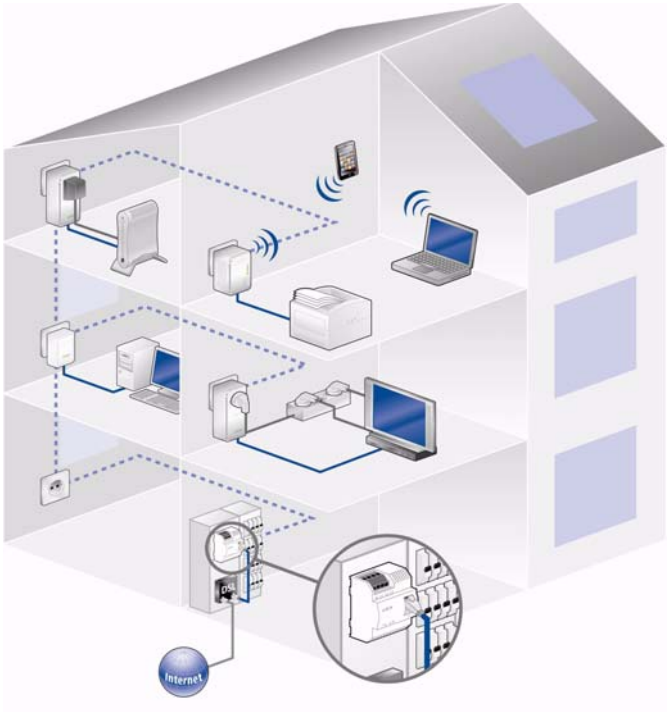

Fig. 2

dLAN 200 AVpro DINrail as a link between the power industry and telecommunications for recording energy data (Fig. 3)

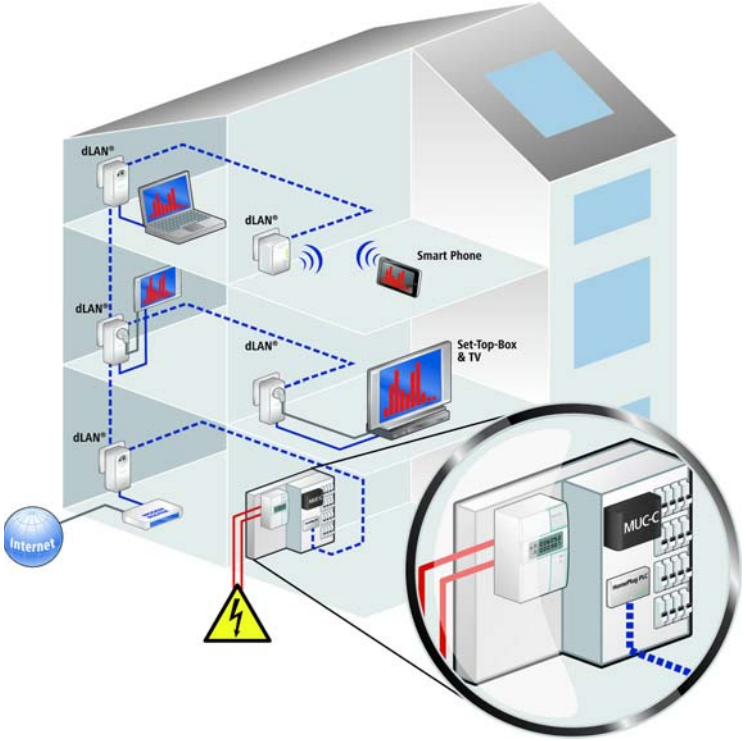

Fig. 3

3 Installation

In this chapter we describe the electrical installation of the dLAN 200 AVpro DINrail on the top-hat rail in the power distribution box.

Package contents

Please ensure that the delivery is complete before beginning with the installation of your dLAN 200 AVpro DINrail.

- dLAN 200 AVpro DINrail
- Ethernet cable
- CD containing software and online documentation

devolo AG reserves the right to change the package contents without prior notice.

System requirements

- **Operating systems**: Windows XP (32-bit), Windows Vista Home Premium (32-bit/64-bit), Windows 7 Home Premium (32-bit/64-bit), Linux (Ubuntu), Mac (OS X) and all operating systems with network support
- **Ethernet connection**

*for Germany: NAV = Niederspannungsanschlussverordnung (Low-voltage Connection Ordinance) of 3 September 2010

3.1 Important safety instructions

All safety and operating instructions should be read and understood before using the device, and should be kept for future reference.

Installation may be performed by a qualified electrician only (in acc. with German Low Voltage Connection Ordinance (NAV)*, Part 2, §13).

Components powered by the mains supply have to be secured with a circuit breaker.

- The device is intended for installation on the top-hat rail in the installation area of overvoltage category 3 or lower.
- Never open the device. There are no user-serviceable parts inside the device.
- Use the device in a dry location only.
- Do not insert any objects into the openings of the device.
- Slots and openings on the case serve as ventilation. Never block or cover them.
- Do not keep the device in direct sunlight.
- Never set up the device near a heater or radiator.

- The device should be located only where sufficient ventilation can be ensured.
- Never use the device with a power supply that does not meet the specifications provided on the rating plate.
- In the event of damage, contact customer service. This applies, for example, if
  - liquid has been spilled on the device or objects have fallen into the device.
  - the device has been exposed to rain or water.
  - the device does not work, even though the operating instructions have been followed properly.
  - the device's case is damaged.

3.2 Electrical installation

1 Install the dLAN 200 AVpro DINrail properly on the top-hat rail.

Take into account the vertical installation alignment of the device, so that the mains power supply comes from above.

2 Now connect the conductors according to the line connections.

When connecting to the sockets, make sure the conductor cross-section is 0.18 mm² to 6 mm².

- Single-phase connection: Neutral conductors and external conductors are connected to terminals N and L1 (see Fig. 4).
- Three-phase connection: Neutral conductors and external conductors are connected to terminals N and L1. The connection of external conductors L2 and L3 is optional and intended for optimising the signal transmission. The device is supplied with power via terminals N and L1 (see Fig. 5).

Single-phase connection

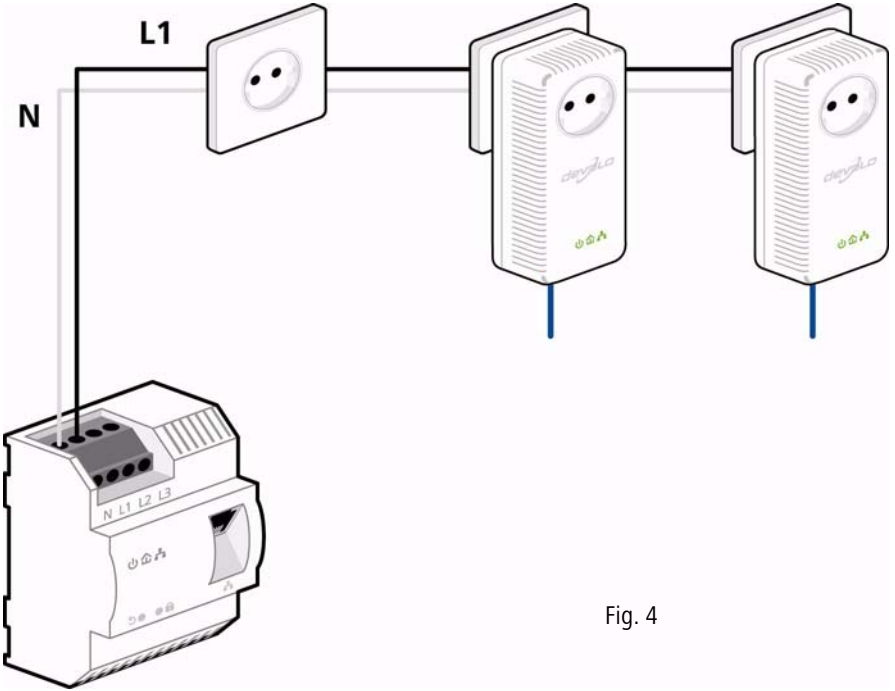

Fig. 4

Three-phase connection

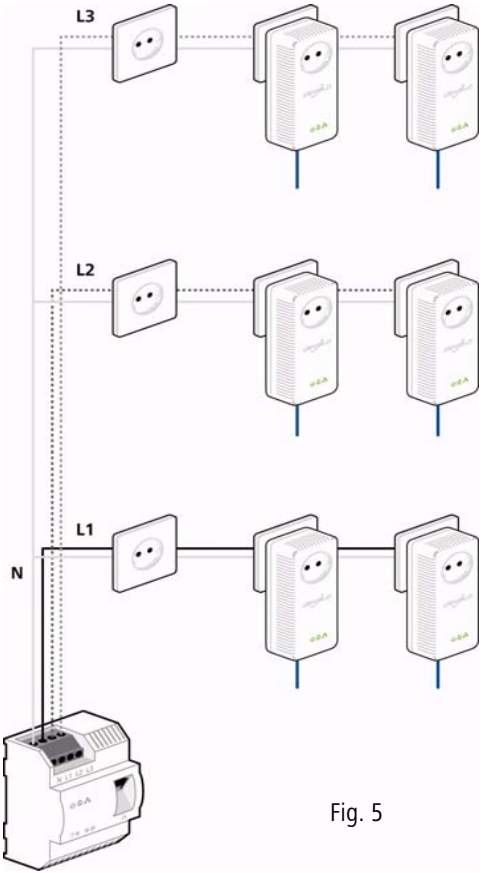

Fig. 5

In general, connection of the dLAN 200 AVpro DINrail to one phase is adequate, even for communicating over multiple phases. To optimise the data transmission, however, we recommend the three-phase connection.

3 After installing the protective cover, the dLAN 200 AVpro DINrail can be connected via Ethernet to the desired network device (e.g. MUC, Internet access device).

As soon as at least one other dLAN AV adapter has been connected and plugged into the mains supply, a dLAN network is set up. Secure the dLAN network against unauthorised access by using the devolo dLAN 200 AVpro manager software or the encryption button. For information on how to proceed, refer to Chapter 4 dLAN network.

For detailed information about connecting other devolo dLAN adapters, visit our website www.devolo.com.

4 dLAN network

4.1 Security in the dLAN

Before you can use the dLAN 200 AVpro DINrail in your dLAN network, first you have to connect it to other dLAN AV devices as a home network. Two specific pieces of information are especially important for this:

- Shared use of the dLAN password serves as access control to the dLAN network and results in a delimited dLAN network.
- Shared use of a dLAN password serves as encryption of the dLAN network, and thereby the interception protection, of the transmitted data.

The dLAN password can be specified automatically via the encryption button or manually using the dLAN 200 AVpro manager program. Please note the following basic principle when choosing your encryption method:

- In dLAN AV networks, data encryption is as simple as touching a button, since all corresponding dLAN AV devices are equipped with an encryption button.
- For dLAN AV networks that include devices with and without encryption buttons, data encryption must be set up using the dLAN 200 AVpro manager.

4.2 dLAN AV network encryption at the touch of a button

To encrypt a dLAN AV network, in which all associated devices are equipped with an encryption button, simply press the encryption button that is located on the device. Pressing this button will encrypt your dLAN AV network with a randomly generated password.

For security reasons, the function of the security button in the dLAN 200 AVpro manager can be disabled.

The following section contains exact instructions of encryption on the basis of possible network scenarios:

Adapters cannot be configured while in Standby mode.

Encrypting a new dLAN AV network with a dLAN 200 AVpro DINrail and an additional dLAN AV adapter (Fig. 6)

Once both dLAN AV adapters have been successfully connected, press each encryption button for one second within two minutes of one another.

That's it! Your dLAN AV network is now protected against unauthorised access.

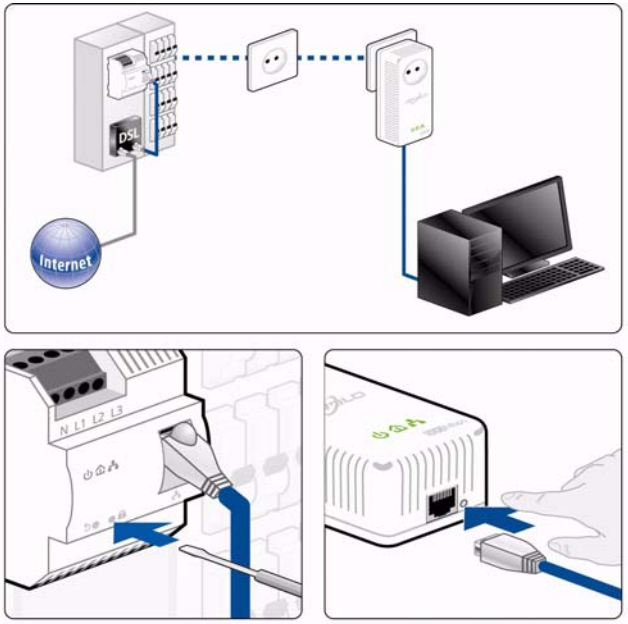

Fig. 6

Expanding an existing dLAN AV network by adding another dLAN AV adapter (Fig. 7)

If you have already secured your existing dLAN AV network using the encryption button, use the same method to integrate further adapters. Once you have successfully connected the new dLAN AV adapter, first press the encryption button (for one second) of one of your network's existing adapters, then press the encryption button (for one second) of your new dLAN AV adapter within two minutes.

That's it! The new dLAN AV adapter is now integrated in your network. To integrate additional dLAN AV adapters in your network, repeat the above steps.

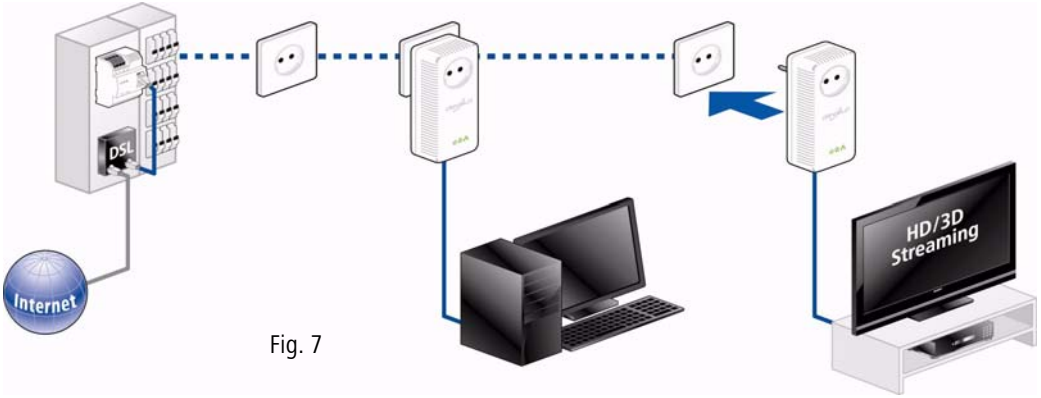

Fig. 7

Removing a dLAN AV adapter from a network (Fig. 8)

To remove a dLAN 200 AVpro DINrail or another dLAN AV adapter from an existing network, press its encryption button for at least ten seconds. The device will be assigned a new randomly generated password and will thus no longer be able to access the network. To integrate the device into a different dLAN AV network, follow the steps described above, depending on whether you are setting up a new network or adding the adapter to an existing one.

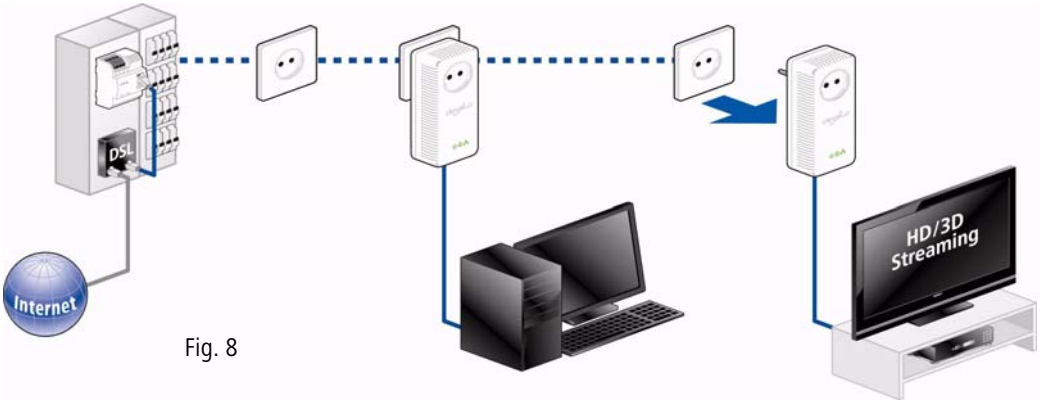

Fig. 8

4.3 dLAN 200 AVpro manager for Windows

The installation wizard installs the devolo dLAN 200 AVpro manager configuration software as well as the associated manual on the Windows operating system.

devolo dLAN 200 AVpro manager encrypts your dLAN network individually and thus secures it against unauthorised access.

To install the software, insert the included CD-ROM in the CD drive of your computer. During the installation process, you will be given the choice of installing all software components ('Standard installation') or selecting individual ones ('Custom installation'). After installation is complete you will find the installed devolo dLAN 200 AVpro manager as well as the associated manual in the program group Start ⇨ All Programs ⇨ devolo.

For detailed descriptions and information on configuration of your dLAN network please consult this devolo dLAN 200 AVpro manager manual.

5 Appendix

5.1 Technical specifications

For technical specifications of the dLAN 200 AVpro DINrail, please see our product sheet on the included product CD.

5.2 Disposal of old devices

To be used in the countries of the European Union and other European countries with a separate collecting system:

The icon with crossed-out wastebasket on the device means that this adapter is an electrical or electronic device that falls within the scope of application of the German Electrical and Electronic Equipment Act. Since 24 March 2006, these types of devices may no longer be disposed of with household waste. Rather, in Germany, they can be given to a municipal collection point free of charge. Contact your municipal government to find out the address and hours of the nearest collection point.

5.3 Warranty conditions

The devolo AG warranty is given to purchasers of devolo products in addition to the warranty conditions provided by law and in accordance with the following conditions:

1 Warranty coverage

a) The warranty covers the equipment delivered and all its parts. Parts will, at devolo's sole discretion, be replaced or repaired free of charge if, despite proven proper handling and adherence to the operating instructions, these parts became defective due to fabrication and/or material defects. Alternatively, devolo reserves the right to replace the defective product with a comparable product with the same specifications and features. Operating manuals and possibly supplied software are excluded from the warranty.

b) Material and service charges shall be covered by devolo, but not shipping and handling costs involved in transport from the buyer to the service station and/or to devolo.

c) Replaced parts become property of devolo.

d) devolo is authorized to carry out technical changes (e.g. firmware updates) beyond repair and replacement of defective parts in order to bring the equipment up to the current technical state. This does not result in any additional charge for the customer. A legal claim to this service does not exist.

2 Warranty period

The warranty period for this devolo product is three years. This period begins at the day of delivery from the devolo dealer. Warranty services carried out by devolo do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

a) If defects appear during the warranty period, the warranty claims must be made immediately, at the latest within a period of 7 days.

b) In the case of any externally visible damage arising from transport (e.g. damage to the housing), the person carrying out the transportation and the sender should be informed immediately. On discovery of damage which is not externally visible, the transport company and the sender are to be immediately informed in writing, at the latest within 3 days of delivery.

c) Transport to and from the location where the warranty claim is accepted and/or the repaired device is exchanged, is at the purchaser's own risk and cost.

d) Warranty claims are only valid if a copy of the original purchase receipt is returned with the device. devolo reserves the right to require the submission of the original purchase receipt.

4 Suspension of the warranty

All warranty claims will be deemed invalid

a) if the label with the serial number has been removed from the device,

b) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),

c) if the device was stored or operated under conditions not in compliance with the technical specifications,

d) if the damage occurred due to incorrect handling, especially to non-observance of the system description and the operating instructions,

e) if the device was opened, repaired or modified by persons not contracted by devolo,

f) if the device shows any kind of mechanical damage, or

g) if the warranty claim has not been reported in accordance with 3a) or 3b).

5 Operating mistakes

If it becomes apparent that the reported malfunction of the device has been caused by unsuitable hardware, software, installation or operation, devolo reserves the right to charge the purchaser for the resulting testing costs.

6 Additional regulations

The above conditions define the complete scope of devolo's legal liability.

a) The warranty gives no entitlement to additional claims, such as any refund in full or in part. Compensation claims, regardless of the legal basis, are excluded. This does not apply if e.g. injury to persons or damage to private property are specifically covered by the product liability law, or in cases of intentional act or culpable negligence.

b) Claims for compensation of lost profits, indirect or consequential detriments, are excluded.

c) devolo is not liable for lost data or retrieval of lost data in cases of slight and ordinary negligence.

d) In the case that the intentional or culpable negligence of devolo employees has caused a loss of data, devolo will be liable for those costs typical to the recovery of data where periodic security data back-ups have been made.

e) The warranty is valid only for the first purchaser and is not transferable.

f) The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, devolo's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.

g) The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between devolo and the purchaser.

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